*Int.J.Curr.Microbiol.App.Sci* (2021) *10*(12): 152-157

*International Journal of Current Microbiology and Applied Sciences*
***ISSN: 2319-7706* Volume 10 Number 12 (2021)**
Journal homepage: http://www.ijcmas.com

**Original Research Article** https://doi.org/10.20546/ijcmas.2021.1012.017

# Prevalence of COVID-19 Infections in Vaccinated and Infected Individuals-Knowledge based Questionnaire-Survey

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**Keywords**

Acute respiratory syndrome–coronavirus 2, mediating viral cell entry

**Article Info**

***Received:***
02 November 2021
***Accepted:***
30 November 2021
***Available Online:***
10 December 2021

## A B S T R A C T

SARS Co-V-2 has been affecting the entire world since March 2020. Vaccines were introduced both Covaxin and Covishield from January 2021 to protect the individuals. Covishield is a viral vector vaccine using modified chimpanzee adenovirus ChAdOx1and Covaxin is an inactivated virus based Covid-19 vaccine. Though the vaccines were targeted initially to cover health care workers, people above the age of 65 and people above 45 with co morbidities, there was a splurge of second wave in April 2021 which claimed the life of many peoples especially young adults. Keeping this in mind this study has been aimed to assess the severity of illness in vaccinated as well as infected individuals. This study is a knowledge based questionnaire study. Aim and Objective of the study: The objective of the study is to find out the prevalence of infection in infected and vaccinated individuals. Methods: The study was done through knowledge-based questionnaire. Results: Out of 306 participants in the study group we had 148 females (48.4%) and 158 males (51.6%) comprising of 61 (19.9%) health care workers, 43(14.1%) home makers and 201(66%) other professionals. Vaccination history of the study participants of 306 people showed that around 199(65%) people received covisheild, 49 (16%) people received covaxin and 56(19%) people did not receive any vaccine. Out of the 306 participants, 58 (19%) people got infected with SARS Co-V-2. In the infected group 25 (43.1%) got infected after vaccination 31 (53.5%) and 2 (3.4%) got infected both before and after vaccination. So we had only 27 people who had infection after vaccination. Among them, we monitored the severity of infection which showed that 22(37.9%) people required only home isolation, 2 person (3.4%) did not have any symptoms 1 people (1.7%) needed oxygen support and other 2 people needed immediate hospitalization (3.4%). Conclusion: Our study concludes vaccine either covishield or covaxin was effective as the severity of infection following vaccination was very mild which required only home isolation.

## Introduction

COVID-19 is caused by the severe acute respiratory syndrome–coronavirus 2 (SARS-CoV-2), a member of the virus family Corona viridae. SARS-CoV-2 has four structural proteins: the spike protein covers the surface of SARS-CoV-2 and binds to the host-cell angiotensin-converting enzyme-2 receptor, mediating viral cell entry. Neutralising antibodies bind here only preventing reinfection. The spread of SARS Co-V-2, the causative agent of Covid-19 has resulted in unprecedented global and economic crisis.[(1)] The entire world knows that the pandemic was declared by WHO on March 11th 2020. While we are trying to recover from the impact of 1st wave which happened in March 2020,[(2)] new variants of SARS-CoV-2 was found out in various parts of the world, including the UK, South Africa, and Nigeria. The vaccines Covaxin and Covishield were introduced in January 2021 after clinical trials. Initially there was a reluctance even among health care workers to take the vaccine. Because of lot of false information from the social media they received that people died after taking the vaccine.[(3)] This problem was there not only in India but also in other countries. A UK based study showed that about 6.0 % of UK and 15% of US people in a study group were reluctant to take the vaccine.[(4)]

The vaccine is needed to cover more than 50 percent of the population to provide herd immunity depending on the infection rate and the acceptance by the community.[(5)] Though vaccination has been initiated the emergence of viral mutants due to variants in S gene continues to give threats to vaccine efficacy. The overall principles informing allocation of vaccines are to: (a) decrease death and serious disease as much as possible; (b) preserve functioning of society; (c) reduce the extra burden the disease is having on people already facing disparities and (d) increase the chance for everyone to enjoy health and well-being. The present study was aimed to study the severity of the infection in vaccinated individuals. It was a survey done through google forms through knowledge based questionnaire study.

## Materials and Methods

The objective of the study is to find out the prevalence of vaccinated individuals in study population.

To find out the severity of infection in vaccinated individuals.

The study is a knowledge based questionnaire study. The questions were given to health care professionals and also to general public which included homemakers and other professionals. Ethical clearance was obtained from the institution.

### Study population

Health care workers and other general public which includes home makers and other professionals.

### Study design

Descriptive based cross sectional study to find out the prevalence of infection in infected and vaccinated individuals.

### Inclusion criteria

People who have been vaccinated against SARS Co-V-2 and who have been infected with SARS Co-V-2.

### Exclusion criteria

People who were not interested to take part in the study were excluded.

## Statistical analysis

The statistical analysis was done with the response from the questions answered by the study group. Descriptive and inferential analysis was used in the study.

## Statistical software

Statistical software SPSS 22.0 and R environment ver.3.2.2 was used for the analysis and Microsoft word and excel were used for the tables.

## Results and Discussion

Around 306 people participated in the study which included 148 females (48.4%) and 158 males (51.6%). The participants included were 61 (19.9%) health care workers, 43(14.1%) home makers, 201(66%) other professional people.(Table 1) Among the included participants 248(81%) people did not have comorbidities and 58(19%) people had comorbidities like hypertension, Diabetes mellitus, thyroid disorders, obesity etc. Among the participants of our 306 people in the study group 248(81%) people received the vaccine and only 58 (19%) did not receive the vaccine. In these 199(65%) people received covishield, 49 (16%) people received covaxin 58(19%) people did not receive the vaccine. (Table 2) Those who were vaccinated had mild symptoms like pain at the jab site, body ache, fever, tiredness, irritation, lack of sleep, giddiness, joint pain etc. All these symptoms lasted for only 2 to 3 days. The survey showed 58 people got infected with covid infection. Among the infected people, 25 (43.1%) people were already vaccinated, 31(53.4%) got the infection before vaccination whereas 2 (3.4%) were affected both before and after vaccination. Regarding the personal protective equipment we analysed for the usage of masks. All 306 participants were wearing the mask when they stepped out of the house. Around 111(36.3%) of patients wore double mask, 110(35.9%) of people wore only N95 mask. 86(28.1%) of people said that they wore only cloth mask. Surgical mask was worn by 70(22.9%) people. (Table 3). Only 12(3.9%) of people wore both mask and face shield. This showed clearly that awareness of social distancing, wearing masks and practicing hand wash has been imbibed in every one very well. We just monitored the severity of infection of covid after vaccination. This showed that 22 (37.9%) people) required only home isolation. 2(3.4%) did not have any symptoms 1(1.7%) needed oxygen support and 2 people needed immediate oxygenation (3.4%).

The present study survey was to find out the prevalence of infection in vaccinated individuals and also to assess the severity of infection in vaccinated individuals. In our study group of 306 people around 248 people had received the vaccine. This showed that the public response to vaccination has been good. Most of them took covishield than covaxin as complete trial of covaxin was not completed by the time the vaccines were introduced. Those who had taken 2 doses of vaccine when they got infected with SARS Co-2 had only mild symptoms. From our study only 58 got infected with SARS Co-V-2 from the group of 306 participants in the study. In that only 25 got infected with SARS Co-V-2 after vaccination. Out of this around 22(81.5%) required only home isolation. This proved that the symptoms of Covid infection was mild after vaccination. This was similar to a study by Emmapitchard *et al.*, which showed that well recognized symptoms of covid were present who were not vaccinated and who had antibodies negative and also PCR negative.[6] Those required hospitalization had comorbidities.

**Table.1** Total number of participants in the study

| Field of work | No. of Patients | % |
|---|---|---|
| Healthcare | 61 | 19.9 |
| Home maker | 43 | 14.1 |
| Other Professional | 202 | 66.0 |
| Total | 306 | 100.0 |

**Table.2** Which Covid vaccine did you take?

| Which vaccine did you take? | No of patients (n=306) | Percentage |
|---|---|---|
| **Covishield** | **199** | **65%** |
| **Covaxin** | **49** | **16%** |
| **N/A** | **56** | **18.3** |

**Table.3** What kind of mask do you wear when you step out of the house?

| What kind of mask do you wear when you step out of the house? | No. of Patients (n=306) | % |
|---|---|---|
| Double mask | 111 | 36.3 |
| N95 mask only | 110 | 35.9 |
| Cloth mask only | 86 | 28.1 |
| Surgical mask only | 70 | 22.9 |
| Mask + Face shield | 12 | 3.9 |

This is similar to Thomson *et al* study which showed that reduction in new infection especially in the age group >75 years than in the age group <75 years following 1st dose of vaccination than with the both doses. Our study did not have any correlation regarding age group.(7) Regarding the usage of PPE, all 306 participants had the awareness about use of masks. Mask is defined as a device covering mouth and nose providing a barrier to minimize the direct transmission of infectious agents in which can be either cloth mask, surgical mask. Around 111(36.3%) of patients wore double mask, though we could not have clear information about double mask how they wore. CDC guide lines says that you should either wear only one N95 mask or you can wear a surgical mask and can wear a cloth mask over surgical mask, or can use double surgical mask. Aiello *et al.*, carried out a randomized controlled study during influenza season, and found 31-51% reduction in the influenza those who wore mask and practice hand hygiene compared to those who practiced hand hygiene during 2006-2007.(8) In our study we could not have clear information

about double masks, due to shortage of surgical and N95 masks, CDC guided usage of cloth masks though there is no guidelines about wash and maintenance. Cloth masks are not advisable for health care workers.

Protection provided by cloth masks can be improved by the material, increasing the number of mask layers, and using those with design that will provide filtration and fit Most of the health care workers wore N95 mask. 110(35.9%) of people wore only N95 mask. 86(28.1%) of people said that they wore only cloth mask. Surgical mask was worn by 70(22.9%) people. Only 12(3.9%) of people wore both mask and face shield. The use of cloth mask is still under debate. During 1918 Spanish Influenza pandemic, masks made of various layers of cotton were used by health care workers and public. Gauze masks were used during second Manchurian plague epidemic in 1920-1921 and plague epidemic in Los Angels in 1924.However the infection rates were quite low in people who wore masks.[9] In Macintyre *et al.,* study showed that the effectiveness of infection reduced with the mask by preventing inhalation and also by reducing the hand to face contact.[10]. The population in Asian countries is quite high compared to western population and crowding in a place enhance the chance of infection. Hence the public has been encouraged to wear mask especially in public places. Macintyre *et al.,* in his study about usage of mask in community settings, observed that mask and hand hygiene may prevent infection.[11] We can definitely control the infection only by wearing masks besides social distancing and hand wash.[12]

Though vaccination is effective, we may need to continue social distancing, practice hand wash and wear PPE till everyone is vaccinated. The draw back in this study was the sample size was very small and there was no adequate data about the effectiveness of vaccine after 1st and also after 2nd dose. We could get the data only after the 2nd dose.

## Conflict of interest

There is no conflict of interest in the study

## Acknowledgement

I would like to acknowledge Dr. Kalpana, Dr. Kalavathy Victor, Dr. Neelushree and also would like to thank miss Shivani Ramakrishnan and statistician Dr. K. P. Suresh

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**How to cite this article:**

Subbalakshmi, E., V. Kalpana Devi, H. Kalavathy Victor and Neelushree, P. 2021. Prevalence of COVID-19 Infections in Vaccinated and Infected Individuals-Knowledge Based Questionnaire-Survey. *Int.J.Curr.Microbiol.App.Sci.* 10(12): 152-157.
doi: https://doi.org/10.20546/ijcmas.2021.1012.017